4.6.16 Traffic

With no work activities at the Moab site, there would be no traffic associated with accessing the site. The minor amount of traffic associated with current site activities would no longer occur.

4.6.17 Tailings Pile Failure from Natural Phenomena

Overall, the possibility of failure and the consequences would be the greatest under the No Action alternative because it would not include the use of engineering controls to mitigate impacts from floods and other natural events, as would occur under the on-site disposal alternative. Because no additional engineered enhancements (e.g., riprap) would be added under the No Action alternative, this alternative would be expected to have consequences closer to the high end of the tailings release assumptions (80 percent tailings release) and risk ranges listed for the on-site disposal alternative assuming a hypothetical failure event.

4.6.18 Environmental Justice

The basis for DOE's analysis of environmental justice impacts is described in Section 4.1.18. An assessment of the census data found that, within the 50-mile radius of the Moab site, less than 1 percent of the population had a household income below $18,244 (the poverty level for a family of four). There is no evidence that a minority population would be exposed to risk at a level higher than the general population.

Although the impacts of the No Action alternative could be high and adverse, DOE has identified no minority or low-income populations that would be disproportionately affected under this alternative.

4.7 Mitigation Measures

The regulations promulgated by the Council on Environmental Quality to implement the procedural provisions of NEPA (40 CFR 1500–1508) require that an EIS include a discussion of appropriate mitigation measures (40 CFR 1502.14[f], 40 CFR 1502.16[h])**.** The term "mitigation measures" includes measures taken to

- Avoid impacts by not taking all or part of an action.
- Minimize impacts by limiting the degree or magnitude of the action and its implementation.
- Rectify impacts by repairing, rehabilitating, or restoring the affected environment.
- Reduce or eliminate impacts by preservation and maintenance operations during the action.
- Compensate for an impact by replacing or substituting resources or environments.

This section specifies measures that could be taken to mitigate adverse impacts associated with DOE's proposed remediation of the Moab site. Most of the mitigation measures discussed would be applicable in some degree to all of the alternative actions and transportation modes described in this EIS. Therefore, mitigation measures are not discussed for each action alternative. Those measures that would be uniquely associated with a specific alternative action or transportation mode (e.g., railroad crossing gates) are identified.

The identification of mitigation measures in this section does not constitute a commitment by DOE to undertake any or all of them. Any such commitments would be incorporated in the ROD following publication of the final EIS. A more detailed description of mitigation measures and an implementation and monitoring plan would be published after the ROD. Mitigation commitments would be tailored to the action selected in the ROD and to the specific location and environment that would be affected by the selected action.

The measures that DOE could implement are delineated below by the specific resource area that they would affect. However, mitigation measures are not repeated where they would apply to multiple impact areas. For example, the use of tarps to cover trucks transporting tailings would mitigate both air quality and human health impacts but are identified only under air quality. Some of the mitigation measures identified below are permit requirements or standard operating procedures but are included here to illustrate the range of activities that would mitigate adverse impacts.

4.7.1 Geology and Soils

- Minimize vegetation disturbance and removal wherever possible.
- Remove and set aside the topsoil overlying borrow soils and maintain the ability of the topsoil stockpiles to support living organisms. Replace, recontour, and revegetate (reseed/replant) topsoil after removal of borrow soil.
- Recontour, revegetate, and maintain all disturbed land areas with diverse, native plant communities to the fullest degree possible.
- Use large-scale (e.g., natural windbreaks/artificial windscreens) and small-scale (e.g., baled straw, drift fences, living fences) wind/erosion control techniques, soil stabilizers (e.g., asphalt emulsions, biomulches, crimped straw, gravel mulches, polymer emulsions, straw blankets, surfactants), soil amendments (e.g., fertilizers), irrigation, and animal damage control measures, as necessary, to ensure establishment of replacement vegetation.
- Minimize soil erosion through recontouring, revegetation, and implementation of the Utah Pollution Discharge Elimination System storm water discharge requirements.
- Apply storm water management measures such as berms, drainage ditches, sediment traps, contour furrowing, retention ponds, and check dams.
- Regularly inspect and maintain project facilities, including the access roads, to ensure that erosion levels remain the same as or less than current conditions.

4.7.2 Air Quality

- Implement a dust control system following provisions in the *Fugitive Dust Control Plan for the Moab, Utah, UMTRA Project Site* (DOE 2002a), which complies with State of Utah requirements specified in the *Utah Administrative Code* titled "Emission Standards: Fugitive Emissions and Fugitive Dust" (UAC 2000). Apply liquid or solid surfactants (e.g., sodium or magnesium chloride or water) as necessary to control fugitive dust.
- Limit vehicle speeds along dirt roads or construction sites to 25 mph.
- Shut down idling construction equipment, if feasible.
- Use tarps or other mechanical means to cover haul truck beds and tailings conveyor belts.
- Use surfactants or car covers to stabilize tailings being hauled by rail.

- Use negative-pressure facilities for sieving/repulping for slurry formation.

4.7.3 Surface Water

- Develop, promulgate, and implement a storm water management plan that complies with all requirements of the Utah Pollutant Discharge Elimination System general permit and U.S. Army Corps of Engineers permit requirements.
- Place new access roads/pipeline corridors outside of ephemeral stream areas, where possible.
- Ensure that engineered crossings comply with UDEQ installation guidelines where access roads/pipeline corridors cross stream beds or dry washes. Methods may include avoiding installation during periods of flow, armoring streambanks near the culvert entrances and exits, installing culverts on straight sections of stream to ensure unimpeded flow, and following the contour of the stream channel. If access roads cross a dry wash, the road gradient should be 0 percent to avoid diverting surface waters from the channel.
- Install appropriate water and sediment control devices at all dry wash crossings, if necessary.
- Develop and implement a spill prevention and contingency plan to minimize the potential for spills of hazardous material, including provisions for storage of hazardous materials and refueling of construction equipment within confines of protective berms.
- Develop a spill containment and recovery plan and notification and activation protocols.
- Keep vehicles and equipment in good working order to prevent oil and fuel leaks.

4.7.4 Floodplains and Wetlands

- If the on-site disposal alternative were implemented, provide flood/river migration protection to the pile by installing a buried riprap diversion wall.
- If it is conclusively demonstrated that mill-related ground water contamination is reaching the Matheson Wetlands Preserve, install and operate a ground water remediation system on the east bank of the Colorado River.
- Delineate wetlands and, wherever possible, locate construction activities (including pipeline and access roads) away from wetland areas. Where avoidance is not possible, provide compensation for wetland impacts in accordance with U.S. Army Corps of Engineers Section 404 permitting requirements.
- Revegetate disturbed areas of the floodplain at the Moab site.

4.7.5 Aquatic Ecology

- Screen the intake to the enhanced water pump station to minimize entrainment of aquatic species.
- Implement interim actions designed to reduce contaminant concentrations in ground water to minimize impacts to aquatic species prior to the time when active ground water remediation would begin to reduce the risk to aquatic species.

4.7.6 Terrestrial Ecology

- Conduct field surveys prior to development activities to identify populations of species of concern. Adjust the construction footprint, access road alignments, or pipeline corridors to avoid them if possible.
- Minimize habitat and wildlife displacement/destruction by placing new construction in areas with relatively little habitat value and minimizing site disturbance to the extent practicable.
- Schedule ground-clearing activities during periods that would not disrupt breeding or nesting bird species of concern or migratory birds.
- Minimize the amount of time between ground clearing and site reclamation (establishment of replacement vegetation) in order to reduce the amount of time an area or habitat is taken out of wildlife use (facilitate recolonization by wildlife as expeditiously as possible).
- Avoid impacts by limiting activities near the site periphery, pointing lights downward, and installing light shields to limit the amount of light beyond the site boundary.
- Design the tailings pile cover to limit animal intrusion.

4.7.7 Cultural Resources

- Document and photograph the existing mill facilities in consultation with the State Historic Preservation Officer.
- Minimize potential adverse impacts to buried archaeological or cultural resources**.**

  During construction of the proposed pipeline or disposal cells, there is the possibility of encountering buried archaeological or cultural resources, including human remains. To minimize the potential adverse effects to unanticipated discoveries during construction, basic information would be provided to workers involved in ground-disturbing activities regarding the recognition of archaeological resources and Native American cultural items and the procedures to be followed upon discovery. The construction contractor would be required to ensure that discovery procedures were implemented in all applicable cases. These procedures would address the responsibilities under 36 CFR 800.13, 43 CFR 10.4, Section 3(d)(1) of the Native American Graves Protection and Repatriation Act (NAGPRA), and the State of Utah historic preservation and burial laws.

  Discovery procedures (summarized below) would be addressed in detail during consultation with the State Historic Preservation Officer. Should human remains be discovered, the local coroner, law enforcement agency, and DOE must be notified immediately. If the burials were identified as being Native American, NAGPRA regulations could be applicable. Immediately after the discovery, construction in the area would cease. A qualified archaeologist would evaluate the extent of the construction exclusion zone. Construction would not resume in the area until directed by the archaeologist. In compliance with applicable state and federal laws, notification of other agencies, Native American groups, and/or the State Historic Preservation Officer could be required prior to removal to determine which party had a legitimate claim to the remains. In the event that archaeological resources were discovered after the project had begun, a qualified archaeologist would be notified, and all construction in the vicinity of the discovery would cease. An evaluation would be made regarding the extent of the construction exclusion zone, and construction would not resume in the area until

directed by the archaeologist. DOE and the State Historic Preservation Officer would be notified. For expediency's sake, the newly discovered property would be considered eligible for the National Register of Historic Places (as stipulated in 36 CFR 800.13[c]) and a treatment plan would be developed to mitigate any adverse effects. However, if the property is clearly ineligible, and there is agreement with this determination by the representative of DOE and the State Historic Preservation Officer, the property would be considered not eligible and would not be subject to further consideration.

- Require site workers to receive training on the need to protect cultural resources and the legal consequences of disturbing cultural resources.
- Document the existing mill facilities in consultation with the State Historic Preservation Officer.
- Perform site-specific cultural and archeological surveys and traditional cultural properties investigations prior to any ground disturbance.
- Plan and conduct all construction (access roads, disposal cells, support facilities, etc.) so as to avoid known cultural resource sites to the fullest extent possible.
- Use existing access roads and previously disturbed land to the fullest extent possible to minimize new disturbances.
- Limit construction equipment to designated areas.
- Limit information regarding the location of cultural resources to a need-to-know basis. On maps and in specifications provided to construction contractors, indicate cultural sites as generic avoidance areas to maintain site confidentiality.
- Monitor an eligible cultural resource during surface-disturbing activities to ensure that it is avoided.
- Move cultural resource objects from areas of disturbance to nearby undisturbed areas.
- Excavate and record cultural resource data prior to the start of construction activities.
- Maintain consultations with affected tribes and communities regarding traditional cultural properties.
- Provide historical information about the former Atlas millsite and its operations to the Dan O'Laurie Canyon Country Museum in Moab, Utah.
- Construct a roadside turnout at the Moab site and erect a kiosk containing historical information about the former Atlas millsite.

4.7.8 Noise and Vibration

- Use equipment with sound-control devices installed to the fullest extent possible.
- Use equipment with muffled exhaust.
- Prohibit noise-generating construction activity within 1,000 ft of a residential structure between the hours of 10:00 p.m. and 7:00 a.m.
- Notify landowners directly affected by remediation of vicinity properties at least before initiation of activities.
- Avoid any activities that could pose a vibration hazard to irreplaceable geologic formations (for example, the arches in Arches National Park or elsewhere).

4.7.9 Visual Resources

- Paint temporary field offices and other erected or emplaced facilities or structures a color similar to the background soils or vegetation to reduce visual impacts to potential viewers.
- Shield night lighting to reduce night sky glare that could be visible from Arches National Park.
- Plant a hedgerow of trees and shrubs between the Moab tailings pile and US-191 and SR-279 to reduce visual contrasts.
- To reduce adverse visual impacts of a permanent disposal cell on the Moab site, lessen the steepness of the side slopes, place beige- and red-colored riprap on the side slopes, and recontour the cell to a more complex, less geometric, shape.

4.7.10 Infrastructure

- Stagger or coordinate shipments of sanitary waste to the Moab sewage treatment plant to avoid taxing treatment plant capacities.

4.7.11 Traffic

- Coordinate routing and scheduling of construction traffic with state and county road staff and Union Pacific Railroad.
- Employ traffic control flaggers and post signs warning of construction activity and merging traffic when necessary for short interruptions of traffic.
- Repair any damage to local roads caused by vicinity property remediation.
- Install gates on access roads if requested to reduce unauthorized use.
- Spread debris haulage out over the life of the project to minimize transportation impacts.
- If rail transportation were identified as DOE's preferred alternative, coordinate with the Union Pacific Railroad, the DOT, and the UDOT regarding the need to enhance the safety of grade level rail/road crossings by using approaches such as signing and pavement markings, active warning devices, illumination, crossing surfaces, sight-distance improvements, geometric improvements to the roadway approaches, and closing and/or consolidating crossings.
- If it were determined that projected train frequency and speed combined with projected road traffic warranted installation of the improvements listed above, fund the improvements and, if requested by the railroad, remove and dispose of the improvements after completion of rail haul operations.

4.7.12 Health and Safety

- Use signs and a system of ropes or fences to delineate radiation control areas to reduce exposure to radioactive material.
- Control access to contamination areas.
- Perform radiological surveys and decontamination as needed to reduce the spread of and exposure to radioactive material.

- Perform industrial hygiene surveys to identify potential chemical hazards and reduce exposure.
- Decontaminate trucks and/or railcars hauling radioactive material after loading and unloading of contaminated material.
- Install a leak detection and management system if the slurry pipeline option were selected for an off-site disposal alternative.

4.8 References

36 CFR 800. Advisory Council on Historic Preservation, "Protection of Historic Properties."

43 CFR 10. U.S. Department of the Interior, Bureau of Reclamation, "Native American Graves Protection and Repatriation Regulations."

40 CFR 50. U.S. Environmental Protection Agency, "National Primary and Secondary Ambient Air Quality Standards."

40 CFR 192, U.S. Environmental Protection Agency, "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings."

40 CFR 1500–1508. Council on Environmental Quality, "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act."

50 CFR 17. U.S. Department of the Interior, Fish and Wildlife Service, "Endangered and Threatened Wildlife and Plants."

59 FR 7629. *Environmental Justice in Minority Populations and Low-Income Populations*, Executive Order 12898, February 11, 1994.

BEA (Bureau of Economic Analysis), 1997. *Regional Multipliers: A User Handbook for the Regional Input-Output Modeling System (RIMS II)*, third edition, U.S. Department of Commerce, March.

Beitinger, T.L., W.A. Bennett and R.W. McCauley, 2000. "Temperature tolerances of North American fishes exposed to dynamic changes in temperature in *Environmental Biology of Fishes* 58: 237–275.

BLM (Bureau of Land Management), 1995. Grand County Landfill R&PP UTU-71889 and Access Road Right-of-Way UTU-73251, Environmental Assessment No. UT-068-95-038, prepared by the U.S. Department of the Interior, Bureau of Land Management, Grand Resource Area, Moab, Utah, May.

BLM (Bureau of Land Management), 2003. *Visual Resource Management System*, Handbooks H-8410-1, "Visual Resource Inventory," and H-8431-1, "Visual Resource Contrast Rating," available at: http://www.blm.gov/nstc/VRM/vrmsys.html, dated March 25, 2003.